

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Sukant Tripathy, Lynne A. Samuelson, Ferdinando F. Bruno, Sucharita Roy,
Ramaswamy Nagarajan, Jayant Kumar, Bon-Cheol Ku, and Soo-Hyoung Lee

Divisional Application of

Application No.: 09/994,998

Filed: November 27, 2001

Title: POLYMERIZATION OF AROMATIC MONOMERS USING DERIVATIVES OF
HEMATIN

Date: <u>4/16/04</u>
EXPRESS MAIL LABEL NO. <u>EV 214957874 US</u>

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Information Disclosure Statement is submitted:

☐ under 37 CFR 1.129(a), or

(First/Second submission after Final Rejection)

☒ under 37 CFR 1.97(b), or

(Within any one of the following time periods: three months of filing national application (other than a CPA) or date of entry of the national stage in an international application; or before the mailing date of a first office action on the merits in a non-provisional application, including a CPA, or a Request for Continued Examination).

☐ under 37 CFR 1.97(c) together with either:

☐ a Statement under 37 CFR 1.97(e), as checked below, or

☐ a \$180.00 fee under 37 CFR 1.17(p), or

(After the 37 CFR 1.97(b) time period, but before final action or notice of allowance, whichever occurs first)

☐ under 37 CFR 1.97(d) together with:

☐ a Statement under 37 CFR 1.97(e), as checked below, and

☐ a \$180.00 fee under 37 CFR 1.17(p), or

(Filed after final action or notice of allowance, whichever occurs first, but on or before payment of the issue fee)

☐ under 37 CFR 1.97(i):

Applicant requests that the IDS and cited reference(s) be placed in the application filewrapper.

(Filed after payment of issue fee)

Statement Under 37 CFR 1.97(e)

- ☐ Each item of information contained in this Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement; or
- ☐ No item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned, after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of this Information Disclosure Statement.

Statement Under 37 CFR 1.704(d) (Patent Term Adjustment)

Applies to original applications (other than design) filed on or after May 29, 2000

- ☐ Each item of information contained in the Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart application and this communication was not received by any individual designated in § 1.56(c) more than thirty days prior to the filing of the Information Disclosure Statement.
- ☒ Enclosed herewith is form PTO-1449:
- ☐ Copies of the cited references are enclosed.
- ☐ Since this application was filed after June 30, 2003, copies of issued U.S. patents and published U.S. applications are not required and are not being provided.
- ☒ The cited references were entered in prior application, U.S. Application No. 09/994,998, to which priority under 35 U.S.C. 120 is claimed. The earlier application contains copies of the cited references.
- ☐ The listed references were cited in the enclosed International Search Report in a counterpart foreign application.
- ☐ The "concise explanation" requirement (non-English references) for reference(s) [] under 37 CFR 1.98(a)(3) is satisfied by:
- ☐ the explanation provided on the attached sheet.
- ☐ the explanation provided in the Specification.
- ☐ submission of the enclosed International Search Report.
- ☐ submission of the enclosed English-language version of a foreign Search Report and/or foreign Office Action.
- ☐ the enclosed English language abstract.

☐ Applicant requests that the following non-published pending applications be considered:

Examiner's
Initials

____ U.S. Patent Application No. [], by [inventor(s)], filed [], Docket No.: []
____ U.S. Patent Application No. [], by [inventor(s)], filed [], Docket No.: []
____ U.S. Patent Application No. [], by [inventor(s)], filed [], Docket No.: []

Examiner

Date

- ☐ A copy of each above-cited application, including the current claims, is enclosed.
- ☐ A copy of each above-cited application, including the current claims, is enclosed, except those entered in prior application, U.S. Application No. [], to which priority under 35 U.S.C. 120 is claimed.

The Examiner is requested to return a copy of the above list of pending applications indicating which references were considered with the next office communication.

It is requested that the information disclosed herein be made of record in this application.

Method of payment:

- ☐ A check for the fee noted above is enclosed, or the fee has been included in the check with the accompanying Reply. A copy of this Statement is enclosed.
- ☐ Please charge Deposit Account 08-0380 in the amount of \$[]. A copy of this Statement is enclosed.
- ☒ Please charge any deficiency in fees and credit any overpayment to Deposit Account 08-0380.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By Jesse A. Fecker
Jesse A. Fecker
Registration No.: 52,883
Telephone: (978) 341-0036
Facsimile: (978) 341-0136

Concord, MA 01742-9133

Dated: 4-16-04

PTO-1449 REPRODUCED INFORMATION DISCLOSURE CITATION IN AN APPLICATION April 15, 2004 (Use several sheets if necessary)	ATTORNEY DOCKET NO. 2328.2003-002		APPLICATION NO. Divisional of 09/994,998	
	FIRST NAMED INVENTOR Sukant Tripathy		FILING DATE April 16, 2004	
	EXAMINER		CONFIRMATION NO.	GROUP

U.S. PATENT DOCUMENTS

EXAM- INER INI- TIAL	REF. NO.	DOCUMENT NUMBER Number-Kind Code (if known)	ISSUE DATE / PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE OR APPLICANT OF CITED DOCUMENT
	AA	5,253,100	10-12-1993	Yang <i>et al.</i>
	AB	5,370,825	12-06-1994	Angelopoulos <i>et al.</i>
	AC	5,420,237	05-30-1995	Zemel <i>et al.</i>
	AD	5,489,400	02-06-1996	Liu <i>et al.</i>
	AE	6,018,018	01-25-2000	Samuelson <i>et al.</i>
	AF	6,150,491	11-21-2000	Akkara
	AG	5,994,498	11-30-1999	Tripathy <i>et al.</i>
	AH	5,143,828	09-01-1992	Akkara <i>et al.</i>
	AI	5,711,867	01-27-1998	Przybycien, <i>et al.</i>

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER Country Code-Number-Kind Code (if known)	DATE MM-DD-YYYY	NAME OF PATENTEE OR APPLICANT OF CITED DOCUMENT	TRANSLATION YES NO	

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

	AR	Tzou, K., and Gregory, R.V., "A method to prepare soluble polyaniline salt solutions - <i>in situ</i> doping of PANI base with organic dopants in polar solvents," <i>Synthetic Metals</i> , 53: 365-377 (1993).
	AS	Nguyen, M.T., <i>et al.</i> , "Synthesis and properties of novel water-soluble conducting polyaniline copolymers," <i>Macromolecules</i> , 27: 3625-3631 (1994).
	AT	Shannon, K. and Fernandez, J.E., "Preparation and properties of water-soluble, poly(styrenesulfonic acid)-doped polyaniline," <i>J. Chem. Soc., Chem. Comm.</i> , 643-644 (1994).
	AU	Tanaka, K., <i>et al.</i> , "Doping effect of C ₆₀ on soluble polyaniline," <i>Synthetic Metals</i> , 66:193-196 (1994).

EXAMINER	DATE CONSIDERED
----------	-----------------

PTO-1449 REPRODUCED INFORMATION DISCLOSURE CITATION IN AN APPLICATION April 15, 2004 (Use several sheets if necessary)	ATTORNEY DOCKET NO. 2328.2003-002		APPLICATION NO. Divisional of 09/994,998	
	FIRST NAMED INVENTOR Sukant Tripathy		FILING DATE April 16, 2004	
	EXAMINER		CONFIRMATION NO.	GROUP

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

AV	Ferreira, M., <i>et al.</i> , "Molecular self-assembly of conjugated polyions: a new process for fabricating multilayer thin film heterostructures," <i>Thin Solid Films</i> , 244:806-809 (1994).
AW	Ng, S.C., <i>et al.</i> , "Poly(<i>o</i> -aminobenzylphosphonic acid): a novel water soluble, self-doped functionalized polyaniline," <i>J. Chem. Soc., Chem. Commun.</i> , 1327-1328 (1995).
AX	Chen, S. and Hwang, G., "Synthesis of water-soluble self-acid-doped polyaniline," <i>J. Am. Chem. Soc.</i> , 116:7939-7940 (1994).
AY	Chen, S. and Hwang, G., "Water-soluble self-acid-doped conducting polyaniline: structure and properties," <i>J. Am. Chem. Soc.</i> , 117:10055-10062 (1995).
AZ	Chan, H.S.O., <i>et al.</i> , "A new water-soluble, self-doping conducting polyaniline from poly(<i>o</i> -aminobenzylphosphonic acid) and its sodium salts: synthesis and characterization," <i>J. Am. Chem. Soc.</i> , 117:8517-8523 (1995).
AR2	Dordick, J.S., <i>et al.</i> , "Peroxidases depolymerize lignin in organic media but not in water," <i>Proc. Natl. Acad. Sci. USA</i> , 83:6255-6257 (1986).
AS2	Dordick, J.S., <i>et al.</i> , "Polymerization of phenols catalyzed by peroxidase in nonaqueous media," <i>Biotechnology and Bioengineering</i> , 30:31-36 (1987).
AT2	Kazandjian, R. Z., <i>et al.</i> , "Enzymatic analyses in organic solvents," <i>Biotechnology and Bioengineering</i> , 28:417-421 (1986).
AU2	Klibanov, A.M. <i>et al.</i> , "Enzymatic removal of toxic phenols and anilines from waste waters," <i>J. Appl. Biochem.</i> , 2:414-421 (1980).
AV2	Sakaki, J., <i>et al.</i> , "Lipase-catalyzed asymmetric synthesis of 6-(3-chloro-2-hydroxypropyl)-1,3-dioxin-4-ones and their conversion to chiral 5,6-epoxyhexanoates," <i>Tetrahedron: Asymmetry</i> , 2:343-346 (1991).
AW2	Ikeda, R., <i>et al.</i> , "Novel synthetic pathway to a poly (phenylene oxide). Laccase-catalyzed oxidative polymerization of syringic acid," <i>Macromolecules</i> , 29: 3053-3054 (1996).
AX2	Akkara, J.A., <i>et al.</i> , "Synthesis and characterization of polymers produced by horseradish peroxidase in dioxane," <i>J. Polymer Sci.: Part A: Polymer Chemistry</i> , 29:1561-1574 (1991).
AY2	Klibanov, A.M. and Morris, E.D., "Horseradish peroxidase for the removal of carcinogenic aromatic amines from water," <i>Enzyme Microb. Technol.</i> , 3:119-122 (1981).

EXAMINER	DATE CONSIDERED
----------	-----------------

PTO-1449 REPRODUCED INFORMATION DISCLOSURE CITATION IN AN APPLICATION April 15, 2004 (Use several sheets if necessary)	ATTORNEY DOCKET NO. 2328.2003-002		APPLICATION NO. Divisional of 09/994,998	
	FIRST NAMED INVENTOR Sukant Tripathy		FILING DATE April 16, 2004	
	EXAMINER		CONFIRMATION NO.	GROUP

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

AZ2	Ayyagari, M.S., <i>et al.</i> , "Controlled free-radical polymerization of phenol derivatives by enzyme-catalyzed reactions in organic solvents," <i>Macromolecules</i> , 28:5192-5197 (1995).
AR3	Bruno, F.F., <i>et al.</i> , "Enzymatic mediated synthesis of conjugated polymers at the Langmuir trough air-water interface," <i>Langmuir</i> , 11:889-892 (1995).
AS3	Lapkowski, M., "Electrochemical synthesis of linear polyaniline in aqueous solutions," <i>Synthetic Metals</i> , 35:169-182 (1990).
AT3	March, J., in <i>Advanced Organic Chemistry - Reactions, Mechanisms, and Structure</i> (NY: Magraw-Hill Company), pp.667, 668 (1977).
AU3	Shinohara, H., <i>et al.</i> , "Enzyme microsensor for glucose with an electro-chemically synthesized enzyme-polyaniline film," <i>Sensors and Actuators</i> , 13:79-86 (1988).
AV3	Alva, K.S., <i>et al.</i> , "Biochemical synthesis of water soluble polyanilines: poly(<i>p</i> -aminobenzoic acid)," <i>Macromol. Rapid Comm.</i> , 17:859-863 (1996).
AW3	Liao, Y., and Levon, K., "Solubilization of polyaniline in water by interpolymer complexation," <i>Macromol. Rapid Commun.</i> , 16: 393-397 (1995).
AX3	Excerpts from "Plastics Engineering: Plastics - Saving Planet Earth," Volume LIII, Number 3 (Toronto; March, 1997).
AY3	Westerweele, E., <i>et al.</i> , "'Inverted' Polymer Light-Emitting Diodes on Cylindrical Metal Substrates," <i>Advanced Materials</i> , 7(9):788-790 (1995).
AZ3	Ryu, K., <i>et al.</i> , "Peroxidase-Catalyzed Polymerization of Phenols: Kinetics of <i>p</i> -Cresol Oxidation in Organic Media," <i>American Chemical Society Symp. Ser.</i> , 389:141-157 (1989).
AR4	Alva, K.S., <i>et al.</i> , "Novel Immobilization Techniques in the Fabrication of Efficient Electrochemical Biosensors," <i>SPIE</i> , 2716: 152-163(1996).
AS4	Genies, E.M., <i>et al.</i> , "A rechargeable battery of the type polyaniline/propylene carbonate -LiClO ₄ /Li-Al," <i>Journal of Applied Electrochemistry</i> 18:751-756 (1988)
AT4	Samuelson, L.A., <i>et al.</i> , "Biologically Derived Conducting and Water Soluble Polyaniline," <i>Macromolecules</i> 31:4376-4378 (1998).

EXAMINER	DATE CONSIDERED
----------	-----------------

PTO-1449 REPRODUCED INFORMATION DISCLOSURE CITATION IN AN APPLICATION April 15, 2004 (Use several sheets if necessary)	ATTORNEY DOCKET NO. 2328.2003-002		APPLICATION NO. Divisional of 09/994,998	
	FIRST NAMED INVENTOR Sukant Tripathy		FILING DATE April 16, 2004	
	EXAMINER		CONFIRMATION NO.	GROUP

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)		
	AU4	Liu, W., <i>et al.</i> , "Enzymatically Synthesized Conducting Polyaniline," <i>J. Am. Chem. Soc.</i> 121:71-78 (1999).
	AV4	Zhang, Q.M., <i>et al.</i> , "Enzymatic Template Synthesis of Polyphenol," <i>Materials Research Society</i> 600:255-259 (2000)
	AW4	Akkara, J.A., <i>et al.</i> , "Hematin-Catalyzed Polymerization of Phenol Compounds," <i>Macromolecules</i> 33:2377-2382 (2000).
	AX4	Dordick, J. S., "Enzymatic catalysis in monophasic organic solvents," <i>Eynzyme Microbial Technology</i> 11: 194-211 (1989).
	AY4	Dunford, H.B., "Horseradish Peroxidase: Structure and Kinetic Properties," In <i>Peroxidases in Chemistry and Biology Vol. II</i> , J. Everse, <i>et al.</i> , eds (FL: CRC Press, Inc.), pp 2-17 (1991).
	AZ4	Wudl, F., <i>et al.</i> , "Poly(<i>p</i> -phenyleneamineimine): Synthesis and Comparison to Polyaniline" <i>J. Am. Chem. Soc.</i> 109:3677-3684 (1987).
	AR5	Stafström, S., <i>et al.</i> , "Polaron Lattice in Highly Conducting Polyaniline: Theoretical and Optical Studies," <i>The American Physical Society</i> 59:1464-1467 (1987).
	AS5	Shacklette, L.W., <i>et al.</i> , "EMI Shielding of Intrinsically Conductive Polymers," <i>In Search of Excellence by Society of Plastic Engineers and Plastics Engineering</i> 665-667 (1991).
	AT5	Przybycien, P.R., <i>et al.</i> , "Electrochemical Separation Utilizing Metalloporphyrins and Metallophthalocyanines," <i>Chem. Abstract</i> , 128: 162418 (1998).

EXAMINER	DATE CONSIDERED
----------	-----------------